

Customised modular boiler technology

Dipl. WirtschaftsIng. (FH), Dipl. Informationswirt (FH) Markus Tuffner, LOOS INTERNATIONAL

Steam boiler LOOS UNIVERSAL U-MB modular boiler

Shell boilers, also called flame tube boilers, are considered easy to operate and maintain, resistant, rough and long-lasting. Even with changing loads they provide a high-pressure stability and good steam quality. In the long history of steam boiler technology this design type, particularly the three-pass flame-tube boiler, was able to assert itself due to the high energy utilisation and low emission rates. Thus, the boilers used for medium to high steam capacities of up to 55,000 kg/h are almost

exclusively three-pass flame-tube boilers. However, for smaller steam quantities of up to approx. 2,000 kg/h, a multitude of steam boiler designs are competing on the market. This is mainly due to the demanding production processes for three-pass shell boilers compared to less complex designs. The LOOS U-MB three-pass shell steam boiler is a revolution in the market for steam generators in this performance range.

1. Structure and design

The product designation “U-MB” stands for “UNIVERSAL Modular Boiler”. As you can already gather from the name, the boiler consists of several modules, the heat generator part in three-pass design, the steam chamber located above it and an integrated economiser. Each module can be selected independent from the others in a customer-specific way according to the customer's requirements. Energy efficiency, steam quality and emissions can be optimised that way.

As a genuine three-pass boiler it can reach a very high efficiency. Built-in flow control devices in the flame tubes are not necessary.



Three-pass shell boiler LOOS UNIVERSAL Modular Boiler U-MB (boiler in modular design)

The heat generator part of the U-MB is based on the UT boiler design, which has already been proven and tested in practical application for decades.

2. Modular and flexible

The individual boiler body modules are selected according to the customer requirements.

Here the heat exchanger part mainly influences the low emission rate. The generously dimensioned flame tube geometry facilitates an efficient combustion process that reduces the formation of nitrogen oxides.

The selection of the steam part influences the steam quality significantly. The generous dimensioning has a positive effect on the residual steam moisture.

The selection of the economiser directly influences the energy efficiency. The waste gas heat is used for preheating the boiler feed water and a large part of it is recovered that way. Furthermore, fuel consumption and emissions are reduced.

3. Installation

The steam boiler bears the CE mark and meets the requirements of the Pressure Equipment Directive. Therefore, it can be installed and operated in Europe and also in many other countries.

Due to its small base area transport as well as installation can be carried out at low cost.

Due to its optimised water volume it is designated as “product boiler” in many countries. The product of water content x safeguard pressure (pressure capacity product) of many available sizes is less than 20,000. This way, the boiler can be installed almost everywhere e.g. in Germany and Austria. A separate boiler house is not mandatory.

Due to its compact design, the LOOS U-MB is also suitable for container transport or installation. The smaller capacity ranges can be perfectly

integrated in a 20 foot standard container. Various parts of the equipment as well as steam and supply lines protrude from the container roof due to their installation height.

4. Assembly

The LOOS U-MB is delivered as a completely equipped unit. This unit includes the insulated boiler with attached equipment, the boiler control cabinet and a low-emission burner. Sensors and actuators are already wired in the integrated terminal box. Ready-made, hidden and coded cable bundles make it easy for the plant builder to install the electric wiring between boiler control cabinet and terminal box. The control cabinet (design as upright cabinet or wall-mounted cabinet) can be installed according to the conditions on site.

It goes without saying that the U-MB blends in with the extensive LOOS boiler component program. All LOOS modules for fuel supply, water treatment, sewage disposal, water analysis, condensate treatment or heat recovery can be combined with the U-MB.

5. Easy to use new fully automatic system

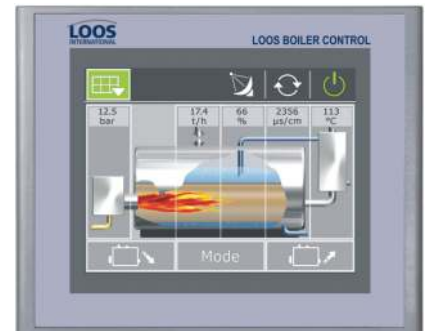
As a genuine three-pass shell boiler, the U-MB provides all benefits of this design. It requires less maintenance, robust centrifugal pumps can be used and it achieves a high pressure stability and steam quality.

The control engineering equipment of the steam generator is unique in this performance segment. As it is the case with LOOS shell boilers, the boiler management system also uses a programmable logic controller, the LBC Loos Boiler Control.

The device takes on all control and regulation functions of the U-MB and it can communicate with other controls (e.g. the Loos System Control LSC, burner management systems, separate

controls of boiler house modules, superordinate control systems) via bus system or network.

A graphically controlled touch panel facilitates easy and intuitive operation.



Touch screen display of the LBC LOOS BOILER CONTROL

Integrated protection functions make operating errors impossible. Storage of operating signals and operating data facilitates an exact analysis and optimisation of the boiler system. The controls are already prepared for the cost-efficient LOOS Teleservice.

New and innovative automatic functions have been integrated in the U-MB steam generator control. The automatic start-up, stand by and shut-down system facilitates starting the boiler at the push of a button or with an external signal from the cold state or the operating state in a boiler protecting way.

The water capacity is heated with low burner capacity until a certain pressure is reached. During this process the system continuously monitors the water level and controls it with the aid of the automatic blow-down valve if necessary. It is important for the boiler water to blend well during the start-up process. Unnecessary strain of the system by thermal stress is avoided. This is achieved by opening the motorised steam extraction valve slightly. A smaller amount of steam can flow off to the connected network. The natural internal water circulation of the boiler starts. If the U-MB is operated as part of a multi-boiler system and the steam cannot flow off into the pressurised network, the steam flows off via the roof.

The automatic shutdown process can

also be triggered by the push of a button or by an external signal. The steam shut-off valve closes and the burner capacity is slowly reduced until the burner eventually interrupts the fuel supply completely.

The boiler is now ready and waiting for the next request.

The integrated overload protection function provides for a high pressure stability and constant steam quality in case of sudden step changes in load. When the operating pressure of the steam boiler is reduced although the burner operates with nominal load this is a definite sign of overload. LBC realises the problem and reduces the steam outlet with the aid of the motorised steam extraction valve until the boiler pressure is stable again. This avoids water entrainment and its follow-up problems like brining and corrosion of downstream components.

6. Easy maintenance and service

When it comes to maintenance expenditure, shell boilers have a general advantage compared to other designs. One of the advantages is the possibility to use maintenance-free circular pumps.

Besides, the boiler provides the necessary inspection and cleaning possibilities. The measuring and water level indicating module facilitates very good access to the water level control and limitation electrodes, and all other valves installed in the boiler crown are easy to access.

Above all, easy service signifies that an optimum adjustment of the steam generators can be carried out quickly. Thanks to the analysing possibilities of the LBC control system (advance warning messages, operating signal storage, operating data storage), trouble shooting as well as energy or operation optimisation are extremely easy.

A close meshed LOOS customer service network and a reliable spare parts service all around the clock every day of the week all year long provide reliability and safe investment.

Quick and cost-efficient help is provided via the teleservice which can be selected as an option.

7. Quality and design

All LOOS products are exclusively produced in Germany and Austria. The production of more than 100,000 boiler systems and over 140 years of experience in the industrial boiler branch speak for themselves.

U-MB as well as the large industrial boiler series are exclusively equipped with high-quality components from high-quality manufacturers. The steam generator is type-examined and manufactured in accordance with the strict guidelines of the Module D quality assurance system of the Pressure Equipment Directive.

The product design of LOOS U-MB clearly sticks out. We consciously omitted the circular basic forms. An aluminium-coloured silencer hood bearing the prominent brand logo marks the "face" of the new U-MB. The distinctive layout of the line and elaborate angular shapes create an exciting play of light and shadows adding three-dimensional depth. The sculptural shape provides an optical experience of the steam boiler's dynamic product features.

8. The price is right

During the development of the U-MB, particular attention was paid to an optimum cost-benefit ratio. The favourable price is due to high quantities, the modular design and the consistent use of common parts. LOOS has also been able to create multitude-use design, control and regulation elements in a manner similar to that in which identical platforms for different types of vehicles are used in the car industry. The annual production of more than 1,500 industrial boiler systems brings about cost advantages that can be passed on to the customers.

9. Summary

The LOOS UNIVERSAL U-MB provides the customer with unmatched steam generator qualities in this class. Thanks to the modular design, the U-MB can be exactly aligned with customer requirements without having to sacrifice the benefit of cost advantages due to large quantities. The result is a steam boiler that matches any large industrial boiler series in function and quality any time.



LOOS UNIVERSAL Modular Boiler U-MB (boiler in modular design) unique in design and all other features

... for a future of quality

LOOS INTERNATIONAL

○ Germany

Loos Deutschland GmbH
Nürnberger Straße 73
91710 Gunzenhausen
GERMANY
Tel. +49 9831 56253
Fax +49 9831 5692253
eMail: sales@loos.de
Internet: www.loosde

○ France

Loos France SAS
Zone d'activités
12, rue de Guebwiller
BP74 Wattwiller
68702 Cernay Cedex
FRANCE
Tel. +33 3 89758484
Fax +33 3 89758480
eMail: loos@loos-france.fr
Internet: www.loos-france.fr

○ Greece

Loos Hellas EPE
Idipodos 16
16675 Athens, Glyfada
GREECE
Tel. +30 2103616090
Fax +30 2103618353
eMail: loos@loos.gr
Internet: www.loosgr

○ Italy

Loos Italia Srl
Via Badia, 74
25060 Cellatica BS
ITALY
Tel. +39 030 322191
Fax +39 030 3732693
eMail: vendite@loositalia.it
Internet: www.loositalia.it

○ Austria

Loos Austria GmbH
Haldenweg 7
5500 Bischofshofen
AUSTRIA
Tel. +43 6462 2527310
Fax +43 6462 252766310
eMail: vertrieb@loos.at
Internet: www.loosat

○ Poland

Loos Centrum Sp.z o.o
ul. Marii Kazimiery 35
01-641 Warsaw
POLAND
Tel. +48 22 5619090
Fax +48 22 5619099
eMail: loos@loos.pl
Internet: www.loospl

○ Russian Federation

Loos Deutschland GmbH
Representative Office in Russia
Proezd Serebryakova 6
129323 Moscow
RUSSIAN FEDERATION
Tel. +7 495 7821254
Fax +7 495 7821174
eMail: loos@loosrussia.ru
Internet: www.loosrussia.ru

○ Skandinavia

Loos Scandinavia A/S
Stenlose Center 18 D, 1.
3660 Stenlose
DENMARK
Tel. +45 47107100
Fax +45 47108011
eMail: loos@loos.dk
Internet: www.loosdk

○ Slovakia

KOTLE – Loos Slovakia, s.r.o.
Einsteinova 1
851 01 Bratislava
SLOVAKIA
Tel. +421 2 67200040
Fax +421 2 62524694
eMail: info@loos.sk
Internet: www.loossk

○ South East Asia

Loos Deutschland GmbH
Singapore Branch
1 Scotts Road, Unit 18-12/13
Shaw Centre
Singapore 228208
SINGAPORE
Tel. +65 67320113
Fax +65 67320397
eMail: loos@loos.sg
Internet: www.loossg

○ Czech Republic

Kotle-Loos spol. s r.o.
Bezová 1 čp. 1658
147 14 Prague
CZECH REPUBLIC
Tel. +420 244112111
Fax +420 244112150
eMail: info@loos.cz
Internet: www.looscz

○ PR China

Loos China Ltd
Tower A, 22A Floor, Room 22A02
OCEAN EXPRESS
No. 66 Xiaguan Rd.
Chaoyang District
Beijing 100027
CHINA
Tel. +86 10 64656979
Fax +86 10 64656975
eMail: loos@looschina.cn
Internet: www.looschina.cn

In addition, agencies in almost all countries of the world.

Internet: www.loos.de

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